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Design and Technology: Systems and Control Technology

SYST2

(Specification 2555)

Unit 2: Learning Through Designing and Making

Report on the Moderation

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Procedures and Administration

Most work arrived on or before the dead-line; however, there are still a couple of centres that send in coursework late making it difficult for moderators to plan for visits and reports while meeting deadline. Centres are reminded to send the design folders in candidate rank order of marks, with the highest on top. The majority of paperwork was in order but some Candidate Record Forms had no annotation or no candidate number or no photo images. The candidate work was presented and packaged better this year with no problems being reported about loose work sheets.

Most of the centres that are submitting candidates work by e-portfolio are doing so successfully; however, there are one or two issues which still need addressing if this is to be completely successful. Centres are now submitting the Candidate Record Forms, Centre Declaration Sheet and Centre Mark Sheet with their CD; however, the CD should contain a single folder for each candidate; labelled with name, number and total mark. Each candidate's folder should contain one single power point presentation, including imported images, text, charts, appendix material with any animation and movie images only at the end lasting a couple of minutes; each slide in the presentation is to have no links to other sheets or the internet etc, each slide should be used like a traditional sheet of paper. Candidates have made very good use of animation and video image capture and in nearly all cases support the centre's manufacturing marks. The final CD produced should be tested on a PC to ensure each folder opens successfully before submission. All the above are problems which have delayed moderators and should be addressed so that we can all benefit from this method of submission.

Exam secretaries should not sign for the teacher where it states that 'the standardisation procedure has been followed' on the Centre Declaration Sheet. Key photographic images should be incorporated or attached to the Candidate Record Forms even if they are duplicates of what is in the candidate's folder. There were some photographic images, which in the main were irrelevant, out of focus and didn't show the system i.e. mechanism, levers, electronic pcb and component assembly, or other system or the important aspects of containment to show quality and accuracy. Images of the 'stages of production' were better but these should serve to highlight text or production charts such as Flow or MRPs.

Arrangements for visits were without exception exemplary.

Investigation and Clarification of Problems *8 marks*

A number of candidates from several centres are now addressing the focus of this Assessment Criteria; however, most candidates have still not grasped the fact that there are only 8 marks for this section. The better candidates stated clearly a breakdown of the problems or issues surrounding the design brief; analysed relevant research, which was applicable to the problems of the Design Brief; included primary research results and made assertions based on them; summarised secondary research and highlighted key aspects; findings from experiments or investigations with a photo image of equipment set up etc.; Well-reasoned Specifications, which draw on the main learning from research and reflect the analysis of how the problem can move forward. (Evidence of key primary and secondary research can be placed in the appendix) The majority of candidates reproduced the actual research material with the better candidates reflecting on the material and how it may be useful in the design of a system. The less able candidates just presented the research material like a text book and in the main received no credit for this.

Specification had generally improved from last year. Most candidates were now listing aspects of the research and the better candidates gave reasons for each criterion point. It was also pleasing to see the majority of candidates now including measureable factors in their specifications. There were many candidates who seemed to know what their solution would be when writing a Specification. These low level Specifications were just lists of 'things' some of which were solutions to the problem and gained little credit.

Development of Design Proposal *24 marks*

Candidates appeared to be well prepared with work at the top end of this AS qualification, which in a number of cases were beyond the subject criteria and could sit alongside any degree level Systems Engineering coursework and indeed some projects were placed at an International Systems Engineering Competition. The weaker candidates generally produced a single system idea to satisfy a Brief and frequently these would just appear on a page with no explanation of its function or where the idea came from. The more able candidates provided evidence of a range of systems ideas and showed evidence of developing these to a workable solution. Final designs often took into account Smart Materials or New Technologies and considered how the sub-systems would be manufactured.

Too many candidates were content with large rectangular pcbs and simple cuboids for containers, at this level some consideration must be taken into account for material cost and the 'form' in which systems are presented. Candidates should consider a more professional design with in-built reliability, finish and accuracy in order to meet specification and performance criteria. At the top end the able candidates produced complex multi-technology systems that relied on good engineering application, low level / high order software programming skills, multi-faceted interface systems and excellent overall problem solving skills. Most candidates provided evidence of 'systems design and development' with the more able candidates providing examples of 'best practice' showing numerous circuit ideas, pcb development, programming with relevant annotation, mechanisms with fixings and customisation of sub-systems to match ergonomic function. Some centres had mastered double sided pcb design and manufacture giving candidates access to a more professional and compact solution. Most candidates showed good evidence in the use of ICT in their folder layout, importing of images, use of a number of CAD software, the planning of schedules, 3-D modelling and the consideration of CAM.

More candidates are using PICs with the less able candidates using them as a solution to any problem. The better candidates showed evidence of the programs from the beginning through to the final design, which were justified and supported by research analysis. Most candidates could have improved their marks by showing, sub-menus, the bit outputs and explaining the function of commands. Far too often candidates used a PIC with programs just appearing and all the design and development focused on the casing. Centres are reminded that this is 'A' Level in Systems & Control and as such the development marks are weighted to the 'Systems Design and Development'.

Photographic evidence within the design folder is now common in showing the making process, testing with breadboards or CAD screen dumps and of the final project. Candidates need to be reminded that the important images are the ones of the 'system' and these should be in focus.

Making / Modelling *24 marks*

Centres had a range of approaches to the course with a large proportion opting for the traditional single project; however, it was pleasing to note an increasing proportion of centres were giving candidates a range of learning experiences. The 'Portfolio' approach to the course was carried out by centres to suit their own strengths and although requiring more management, it provided the candidates with a break from the Design and Make, Design and Make, Design and Make, nature of the subject.

The range of quality and complexity of systems produced varied from a single project with a simple process executed poorly, to a high quality manufactured working machine that had a number of interconnecting systems / technologies of a complex nature. A number of areas can be addressed for candidates to improve their marks:

Lower ability: a focus on completing the system and the quality so as to produce a working outcome. The system should take priority over the casing / container etc.

Mid-range ability: improve accuracy and quality of interconnections i.e. joining of mechanisms, wire connections to pcbs, soldering and the finishing of edges.

High ability: Not to over complicate systems at the expense of finishing a working outcome, wire connections to pcbs and looming of wires.

Evaluation and Testing *12 marks*

There was a general improvement in this assessment criterion with most candidates evaluating against the specification of the system. The better candidates additionally evaluated the strategy set up for testing the system, its performance, future improvements and used others for their opinions. The weakest candidates are still only producing historic accounts of the process of designing and manufacturing a system. There are two areas for improvement generally; candidates should use people outside their department for evaluations of their product/system. People outside the department or Expert Witnesses should have a sheet of prompts or questions to respond to, which focus their attention on the specification criteria or performance of the system; and candidates can evaluate their own learning experience or their ability in the process of designing and manufacturing their system.

Communication and Presentation *12 marks*

Most candidates performed well in this section owing to the nature of the subject and its reliance on the use of ICT. The weaker candidates generally failed to provide sufficient evidence of their work producing sparse images, charts or circuits throughout their folders. The weaker candidates made few comments about their systems only describing what the image or drawing was.

More able candidates used a number of CAD methods presented in their folder with comments included in the main system section, explaining the functions of sub-systems and giving reasoned decisions to the development process. They also used ICT to communicate ideas and concepts through the use of charts, graphs and image capture in various forms. The more able candidate planned how their report / folders were going to be presented and a common theme and layout would appear throughout.

The most able candidates in addition justified all main areas of decision-making, provided clear evidence of why and how systems were developed to satisfy specifications and the performance of the finished outcome. These candidates were able to communicate complex ideas and concepts through text, graphics and ICT.

Total for AS Coursework *80 marks*

Mark Ranges and Award of Grades

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http://www.aqa.org.uk/over/stat.html

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